THE

NEW ENGLAND

Journal of Dentistry

AND

Allied Sciences.

Vol. I. MARCH, 1882. No. 3.

ORIGINAL COMMUNICATIONS.

DENTISTS AS SPECIALISTS.

Presented to the American Academy of Dental Science, at the Fourteenth Annual Meeting, October 26, 1881.

BY GEO. L. PARMELE, M. D., D. M. D., OF HARTFORD, CONN.

In the Code of Ethics of nearly every Dental Association in the United States, under the heading, "*The Relative Duties of Dentists and Physicians*," appears this assertion: "Dental Surgery is a specialty in medical science. Physicians and dentists should both bear this in mind." Although the idea, as expressed in this extract from the Code, *ought* to be true, and I sincerely trust the day may not be far distant when it will, I beg leave to declare that in my opinion dentistry as now practiced by the majority of dentists is not a specialty of medicine. Surely a profession or art in which one-eighth of the practitioners are graduates of dental schools, one-eightieth, perhaps, graduates of medicine, and the balance (about three-fourths) possessors of no degree either academic or scientific, has no right to claim equal standing with a profession whose members, with a few exceptions, have a scientific education and graduation. I would not have you think that I place a light estimate upon the rapid growth and improvement

of a science so important to the comfort and well-being of mankind, for I agree with you all in thinking that the advancement of dentistry during the past century cannot be equalled by any other department of science. Neither do I desire to place a damper on the energy, industry and effort that has been expended to develop our calling to its present standing, but rather to stimulate still further advance in a new direction. Whoever reads our journals and the transactions of our associations, cannot fail to have noticed that there is a desire on the part of the dental profession to be recognized by the medical profession as equals, and we also see it stated that we *are* specialists of medicine and ought to be recognized as such.

What now *are* the relations *really* existing between regular medical and dental graduates (leaving out entirely those who have no degrees whatever)? Merely pleasant and kindly feelings—*that is all.* It is useless to deny that they are not yet what they should be, nor will they be until our members are regular graduates of medicine, having followed the same course of training that members of the medical profession and all specialists, with the exception of dentists, pursue. Until that day arrives, dentistry is not a specialty of medicine. I have always believed that dentistry ought never to have been established as a separate profession; but that every person desiring to practice in any department of medicine should be required to follow a regular course of medical education, and, having graduated as a doctor in medicine, to then perfect himself in the desired department. Thus it is that those who practice ophthalmology, otology, gynecology, etc., are educated, and why should not those desiring to be dental and oral surgeons be required to educate themselves in the same way? Dentists are not, and never can be, specialists of medicine and recognized by the medical profession as such until they are educated in the same manner as other specialists. When such rules are complied with there need be no fear but that the medical profession will give us the "right hand of fellowship."

We again hear it said that a thorough medical education is not requisite to a dentist, and that it is useless to spend the time required to obtain a medical degree, and the additional time necessary to obtain the desired dental training; also that one who is an M. D. is no better qualified for our department than a D. D. S. Allow me, in answer to these points, and as expressing my views, to quote from the address of Dr. J. T. Hodgen of St. Louis, President of the American Medical Association, delivered at the thirty-second annual meeting, in May

last, at Richmond, at which time you are aware a new section entitled dentistry was established as one of the sections of that association. In his address, Dr. Hodgen spoke as follows:

"A simple knowledge, however accurate, of the parts involved does not qualify one to make an intelligent prognosis, to decide upon the advisability of an operation, or treat judiciously even such diseases as consist mainly in pathological changes in the part in question—to say nothing of the many cases in which subjective symptoms are referred to a particular part, when they are in fact but the local expression of some remote or possibly constitutional trouble. Herein lies a danger which threatens the profession through the adoption of exclusive specialties by those not well trained in general medicine. It cannot be denied that the early and exclusive study of the affections of a part tends to narrow the intellectual grasp and cramp the powers of the man who yields to the influences incident to such partial training. In the best sense, a specialist is a physician and something more; in the worst, he is something else and something less than a physician."

A short time since in England, before the General Council of Medical Education and Registration, the question arose whether a diploma from a college of surgeons was a higher qualification in dentistry and whether dentists who held medical and surgical qualifications should have them added to their description in the dental register. During the discussion, Sir James Paget said* "that proper dentistry was something more than a mechanical art; but an ordinary dentist's qualifications did not imply the possession of much more than a limited amount of knowledge. A man of such a qualification would not know much of such things as the state of the liver, presence of gout, &c., on which the treatment of the teeth might turn. Again, as regarded diseases of the jaws, no doubt a dental education gave much help, but a surgical education gave much more. Any one who devotes himself to the special treatment of one part of the body was less qualified for this than the man who studied the whole frame. Again, it was important to excite members of the dental profession to seek more knowledge than they possessed, for the profession would rise as this knowledge was acquired. In the journals of dentistry, the papers written by members of the College of Surgeons were of a higher class than others." Dr. McClintock held that special practice was improved by more extended education. Dr. Pyle, Mr. Spence,

*British Medical Journal, May 7, 1881.

Dr. Stourar and several others expressed similar views with Sir James Paget. It would seem to me, then, that the proper way to place dentistry where it should be, making it a specialty of medicine, would be to abolish its present system of exclusive education, conferring no longer the degrees of D. D. S., or D. M. D., unless they be used as an appendage to the degree of Doctor in Medicine. Let Oral Hospitals be established and Professors of Oral Science be appointed in our Medical Schools. I am well aware that the views expressed in this paper are not entirely new, but as "a continual dropping weareth away the stone," I venture to present them to you so that by continually keeping the subject before the profession an impression may at last be made.

In conclusion, I would earnestly recommend that that portion of our Code of Ethics quoted at the opening of this paper be abolished until such time as it can be used with propriety; and let me urge all among you, who are graduates of medicine, to connect themselves with the medical society of their county, from which they can go as delegates to the American Medical Association, which meets the first Tuesday in June next, at St. Paul, Minnesota. Let those who have not yet obtained the medical degree leave no stone unturned until they have *earned* their diploma in medicine, for by so doing they will not only advance their own interests but will hasten the day when dentistry will be A Specialty of Medical Science.

GELSEMINUM.

BY DR. C. T. STOCKWELL, SPRINGFIELD, MASS.

This is a remedy which we have found of very great advantage in several important cases, where, relying simply upon *local* treatment, we should have undoubtedly failed of success. It is, however, one that must be used with very great care and discrimination; with that intelligent conception of such constitutional conditions as render the action of this drug a specific.

In the hands of those who prescribe for *diseases* simply, without looking deeply into the individual varied *conditions*, it is a dangerous remedy, and had best be let alone. Many cases of fatal results have followed its use when it was *contra-indicated* by constitutional conditions, plainly apparent to those who clearly understand its action and the symptoms, or conditions, calling for its use. Consequently, it has been much condemned, when the condemnation should have

rested upon the head of him who prescribed. Gelseminum, veratrum and aconite are three prominent sedatives, but the conditions indicating the intelligent use of each are markedly different.

The question as to how and when it should be used may not be easily answered. To intelligently or successfully prescribe presupposes an accurate knowledge of pathological conditions; a knowledge of normal and abnormal function. It presupposes also a knowledge of remedies, their effects, the results of varied doses, etc., upon the system, which one must apprehend by other means than by "rote."

In Prof. Scudder's "Specific Medication" may be found a pretty clear statement of its effect and the conditions indicating its use. We quote as follows:

"Gelseminum exerts a specific influence upon the brain, and to a less extent upon the spinal center and sympathetic. It relieves irritation and determination of blood, and a disordered innervation that flows from it. Probably there is no remedy in Materia Medica that is more direct and certain in its action. Given a case of irritation and determination of blood to the brain, marked by flushed face, bright eyes, contracted pupils, restlessness and irritability, we prescribe gelseminum with certainty. This being a common complication in diseases of childhood, it is especially the child's remedy.

Acting in this direction, it lessens the frequency of the heart's action, and removes obstruction to the free flow of the blood—a sedative. It also increases secretion in the same way. I do not think gelseminum exerts any important influence, other than through this action, upon the nervous system. But, as will be observed, this is a very important action.

It is contra-indicated when the circulation is feeble, and there is a *tendency to congestion*, especially if there is a feeble circulation in the nerve centers. We never give it if the eyes are dull, pupils dilated, and the countenance expressionless. In such cases it may prove fatal in quite moderate doses.

It has one other specific action, which is worthy of mention. It is *the* remedy in dysuria from stricture, and will rarely fail in enabling the patient to pass urine in from four to eight hours."

The cases in which we have used this remedy with such gratifying success are the early stages of peri-cementitis and certain forms of neuralgia. In one case of the former, we used it with prompt success where it had passed much beyond the "early stages," and where there were active constitutional complications.

In neuralgic cases, where the chlorotic diathesis is prominent, accompanied by an irritation of the nerve centers, indicated by a contracted pupil, etc., we have found gelseminum an invaluable remedy, acting very speedily. Such cases more or less frequently present themselves where the pain is located about the teeth, usually on the left side, especially during the night time, and, quite frequently, where there is no local lesion whatever. Local treatment is, of course, out of the question. Such cases are quite common with girls in their "teens." Our prescription has usually been about ten drops of the tincture to four ounces of water, and a teaspoonful every one or two hours, according to the severity of the case, and age of the patient.

In general medical practice much larger doses, say from two to ten drops, are sometimes given, but in our experience the *accumulative* effect, gained by the administration of fractional drops, has resulted the most favorable. Thus given, marked effects must not be anticipated under twelve to twenty-four hours; but they are more permanent and satisfactory. If the patent "air brakes" are applied to a highly speeded train in their full force, suddenly, a shock will result, if nothing more; when, if instead of the full force of the brakes applied at once, it is made gradual or accumulative, the train is "slowed up" safely. So with this sedative as applied to the human "train," under an abnormal and dangerous speed—unless the abyss ahead is *immediate*, "slow up" gradually and not too suddenly.

We regret to say that the tincture, usually obtained at the drug-stores, is unreliable and often entirely inert, and that where this is not the case, it is of varying strength; consequently, we are convinced that much of the condemnation visited upon this remedy is attributable to this fact. That which is labeled "*Specific Medicine*" is found to be most reliable and the strongest. We have also found Park, Davis & Co's preparation uniformly good. That this remedy has an important place in dental therapeutics, if rightly used, we fully believe after using the same for several years.

The Sixth Annual Meeting of the Vermont State Dental Society will be held in the parlors of the Van Ness House, Burlington, Vt., Wednesday, March 15, 1882, commencing at 7.30 P. M., and continuing through Thursday and Friday. The programme is a good one, and prominent members of the profession from other States are expected to be present and take an active part.—ED.

VITAL FORCE—HOW PRODUCED AND HOW DEGENERATED.

Vital force is transformed physical and chemical forces, and this transformation requires the previous existence of living matter. Consequently, we derive our vital force from the decomposition of food and tissue.

When anything is produced, it is done through the decomposition, alteration, or change in something already existing. Vital force and vital structures are as dependent upon this principle of nature as any other forces or structures. As fire consumes fuel to produce heat, so life consumes food to produce life and energy. Bone and muscle, brain and nerve can be produced only out of equivalent material, and the forces necessary for their production must have existed in previous material. Food, oxygen and water enter into the human organism; food undergoing change, whilst oxygen, after uniting with the food and causing decomposition, remains unchanged—water being the medium by which elementary material is conveyed to all parts of the body.

Some of the Results of Imperfect Alimentation. — Predisposing causes, although remote, are far the most important, because without them the other causes would not be likely to exist. If the organism were not predisposed, if its vital resources were not depleted, and its instincts rendered abnormal by bad habits, the exciting causes would seldom be brought into operation, or the proximate causes be made to exist. The proximate or existing causes, those which are immemediately connected with the disease, are necessarily the result of the doings, habits or conditions of the patient, while the exciting causes stimulate these into operation and precipitate disease. The proximate causes: obstructions existing in the body, as the immediate cause of disease. They are proximate, because they are immediately connected with the functional derangement; and existing, because they are found in the body as existing facts. They are found in the blood as irritants, commonly termed impure blood—the sequal, congestion, from an unbalanced circulation, ending with deficient nutrition.

Irritation presupposes an irritant. It may be contagion vivum, poisons, improper food, alcohol, tobacco, retained excretions. The remote causes, although preparing the organism for the onset of disease, do not necessitate it. The conservatrix naturae accommodates itself to existing conditions, and it may take a life-time before there are obvious signs of disease. People should realize that, though

a habit does not make them immediately sick, it prepares them for sickness. Food, *per se*, had a prior existence in organized matter; hence, the fallacy of laboratory prepared food. One of the greatest errors of our day, is that certain inorganic substances can be received directly into the system and become a part of the living tissues, viz: vitalized phosphates, phosphoric acid, iron, potassa, lime, magnesia, etc.

Vital power possesses one quality over all other forces; that is, to transform one vital substance into another, in a manner beyond the reach of the chemist. Who pretends to know how to change vegetable matter into bone, muscle and brain? Nothing like any of these can be produced artificially. Yet chemistry, on the subject of digestion and assimilation, demonstrates what are the elements of food, and also the composition of the tissues.

Finally, avoid superfine flour as you would malaria, because it starves every tissue and fluid. The children of this generation, more especially in New England, are prone to the nervous temperament, either congenital or acquired, brought about in a measure by remote causes, one of which is impoverished blood. There are other causes, but space forbids. No wonder that our boys and girls should be unbalanced and undeveloped—more brain than legs; small bones and thin small muscles; imperfect teeth, precocious intellects, etc. Add to this a diathesis, and we have a compound of abnormal defects which requires the aid of the physician, dentist and surgeon to assist the inherent powers to remedy the evil, whether it be one excess, defect or perversion. Excess and defect have especial reference to the circulation of blood, in a part, to its sympathetic innervation; and to its nutrition, perversion may be of these, but also of the more obscure factors of life. If you have either of these conditions in the teeth, would you administer the artificial phosphates? We think not. So far as dentists are concerned, if their journals are criterions, we may safely say that they are the peers of the medical profession in therapeutics. You would medicate excess or defect. This controlled, you would administer the organized phosphates, the entire wheat flour as prepared in nature's laboratory.

WM. H. VINEY.

Keep your gutta-percha in glass bottles well corked. Gutta-percha contains more or less fat which in time is evaporated by exposure, deteriorating its quality.—*Herald of Dentistry*.

DR. TALBOT AND HIS EXPERIMENTS WITH MERCURY, AMALGAMS, ROACHES, ETC.

BY CHAS. MAYR, A. M.

Already in the February number of the *Journal* we proposed to enter upon some of Dr. Talbot's remarkable conclusions, etc., in his paper: On the Effect of Mercury in Amalgam-Fillings, as published in the *Ohio State Journal*, January, 1882. The paper first gives a good synopsis of the grossly chemical facts about mercury. Thus far we agree with the author. But there comes a "Wort zur rechten Zeit!" He says: "The better class of dentists waged war against it (amalgam) on general principles, not alone on account of the deleterious effects of the mercury in its composition, but because of its unsightly appearance and demoralizing effects upon the dental profession." Let us never lose sight of the necessity to separate completely "demoralizing effects upon the profession," and "deleterious effects of the mercury." Let us be honest, and consider exactly why the best practitioners think amalgams demoralizing and are then easily persuaded into their harmfulness. We need not enter into details; every dentist understands the point of "demoralizing," but let not *truth* get demoralized together with the pocket-book. Each point has to be settled alone without reference to the other. We grant to the author the unsightly appearance of amalgams—where they are seen; we admit to him their "demoralizing effect," though we might rather call it "depressing effect;" we think this quite a good and legitimate ground upon which to fight amalgams; but his assertions about the physiological effects of the mercury in amalgams we have to declare as chemical and physiological superstitions.

We notice with pleasure the scientific statement: "The rapidity with which the evaporation of mercury takes place depends upon the amount of heat and the surface exposed, and not upon the quantity of mercury in the filling." This is perfectly correct. Another point to be mentioned as correct is, that after three months' standing no weighable amount of mercury had evaporated from an amalgam. Dr. Talbot only confirmed still more an old observation. His experiments again are quite correct, and no flaw can be found in these fundamental facts; it is well known that mercury vapor is strongly condensed on gold, and one might even object to this rapid condensation as creating unnatural conditions. But, as we will have to show that the experiments had less to do with the amalgam question than with a new process of making black designs on paper, we will

not pick up trifling objections here. If Dr. Talbot had left off the rest of his paper after having related his experiments, it might have been a good lecture; but, by trying to draw conclusions from these experiments, he proves that reasoning soundly and making good experiments are two entirely different things. Dr. Talbot is—speaking scientifically—a good stone-gatherer, but as soon as he tries to make a building with these stones he gets nothing but a shapeless heap.

His assertion: "I am in possession of numberless cases of poisoning from mercury in amalgam-fillings," in this general dogmatic form, can be answered only by one thing: "Doctor, your fancy is very powerful!" He reports a case from the *Dental Register*, 1872, based solely on the saying of two doctors. If *they* agreed that "he was suffering from the effects of mercury, present in the amalgam used in filling one of his teeth," does that prove the very least? The whole story of the doctors and the jury reads so "popular," so utterly unscientific and worthless, that we wonder how Dr. Talbot for a moment could take stock in such a vague statement, if it was not because it suited his idea. We would believe the story to be correct, if at least several hundred thousands of deaths or severe mouth diseases of the same character were reported. But does the doctor really think because an ignorant jury ascribe an œdema glottidis to mercury in amalgams or to the man in the moon, that this proves much for either case?

Just as worthless as such *isolated*, more than doubtful, cases are quotations from authors without sufficient reason to apply them to the point under discussion. No doubt Dr. Bartholow is all right in ascribing to mercury as inhaled, "wasting, ptyalism, etc," but he speaks of gilders and others, hence of people who inhale quantities, many thousand and thousand times more than can ever evaporate from an amalgam, which as Dr. Talbot says did not lose a "weighable amount of mercury in three months." Just the quoted case from Walter Pope, of a workman who had not handled mercury for six months and yet rendered a piece of copper as white as silver, if true, proves that enormous quantities of mercury may be stored up in the body—as most experimenters agree, in the shape of metallic globules—without killing the man. Quite perplexing reads the statement:

"Is it not a reasonable supposition that, if poisonous symptoms are produced in proportion with the subdivision of the particles of mercury, that the system will be more severely affected by the vapor of

mercury, which is finer than any mechanical subdivision?" Of course, doctor, of course! What we have to dread are not so much those six-grain doses of mercury, but those *one* quintillions of grains; they kill! And, furthermore, applying the same sound (?) logic to our dangerous amalgams, the smaller the amalgam the more finely subdivided the vapors from it by being mixed with more air, hence the more dangerous and by simple consequence—doctor, we do not joke!—the amalgam, most approximating nothing, will give off the highest dilution of vapor, hence be most powerful and dangerous; therefore, chiefly those cases where the amalgam plugs have very small surfaces will be dangerous—granting for one moment Dr. Talbot's supposition about those mercurial vapors!

This great danger from those microscopically small amalgams in comparison with the larger ones, as would follow from the basis of Dr. Talbot, receives a kind of support by the story of the crew of the "Triumph," where in spite of the mercury coating all the metal about the ship, only "nearly all of the crew were salivated." Surely, if only one-millionth of a grain had evaporated they all would have died! We only wish to prove ad absurdum a most fanciful, hypothetical, inconsequent way of thinking, as the one is that, the higher the peculiar trituration of homœopathic drugs, the better the effect. This bottomless hypothesis, dating from a time when all about chemistry and physiology was ignorance, unfortunately still now and then takes hold of people of fanciful disposition. We do not wish to be understood that we delare all homœopathy erroneous; there is a certain limit for all drugs upward and downward. The man who prescribes above the physiologically required limit, is an unscientific, dangerous quack; the man who prescribes so far below the exactly required quantity that it has no effect, is an unscientific, superstitious enthusiast, who may be dangerous by neglect. Practically, it is true, if we have to choose between either of the extremes, we rather wish to die naturally without drugs than be killed by drugs, hence we would rather have a "homœopath" than an "allopathic" quack; but scientifically both extremes are equally wrong; the really scientific doctor is in the position of the painter asked what he mixed with his colors to give such fine effects. "Brains!" was the answer. This is the most valuable drug known, but the friends of the ℞. will not always find it among the prescriptions, be it of a "homœopath" or "allopath."

But let us once more turn to Dr. Talbot. He makes experiments

on roaches and mercury and amalgams. Though we have to feel sorry that a high dilution of mercury-vapor destroyed their scientific thirst, yet we would suggest to repeat the experiments, enclosing the roaches *with some food* in the bottle, lest wicked people might say we starved them, while we tried to kill them by mercury. How accidental some of those death-rates are, is shown by the fact that in the same bottle one roach outlived the other by seven days. Those experiments prove nothing even thus. A roach is brought in close proximity to a large quantity of mercury; a roach weighing probably not five grains is surrounded by ten grains of mercury. As the doctor applies his experiments to amalgam-filling, we have to suppose that a weight of mercury of twice the weight of the body is evaporating in the mouth or around the body. In order to have such experiments worth anything, the experimenter must possess a slight idea of figure-proportions. To bring a roach in the atmosphere of twice its weight of mercury, and to compare the result with the effect of an amalgam weighing one seventy-thousandth of the human body reminds us of the boy who got struck by an engine and knocked over, and in afterwards essaying on the properties of Iron, wrote: it is used for needles, it knocks people down and is used for steel pens. About the effects of mercury in amalgams on plants, a great number of experiments have been made by Runge, with pretty nearly opposite results from those of Dr. Talbot. His experiments four and five are of the same inconclusive kind; in one case a guinea pig is put in a four-quart glass jar with *four ounces* of mercury!! When we investigate the effect of *amalgams* we ought not to surround the animal with twice its weight of *pure mercury*. For one cockroach we have to give about—say liberally!—$\frac{1}{2000}$ of a grain, but not 20,000 times as much!! Now to that vapor of mercury! First, Regnault has done vastly more than Dr. Talbot; he has measured the exact tension of mercury-vapor for every degree of temperature. At 0° C. it is .027 millimeters, etc. Regnault has further proved that at 60° Fahrenheit one liter (one quart) of air contains about one-half milligram,—one one-hundredth of a grain—of mercury-vapor *if saturated;* now as Dr. Talbot himself acknowledges that in three months the amalgams did not lose weighable amounts, there follows, that in three months a person would not inhale one quart of vapor of mercury, having a degree of rarefaction as the air has in about two hundred miles' height. If the doctor wishes to prove anything about amalgams with his roaches, the only thing corresponding would be either to put his

roaches into a large box. with plenty of food, air and exercise, and introduce into the box for every roach one two-thousandth of a grain of *amalgam;* better still to insert one two-thousandth of a grain of amalgam into the mandibles or tongues of those creatures, and if they die they prove something. Also here the experiments with the roaches lead to nothing but worthless conclusions. Dr. Talbot will hardly have fancy enough to deny the fact that millions of people wear "tons of amalgams," and live as happy with as healthy mouths as other millions who have gold cropping out at their teeth.

In the discussion which followed the paper, there showed itself an appalling amount of homœopathic superstition. Dr. Cushing alone did not follow the drift of the day, but put the thumb on the sore spot of the whole paper, that the blackening of slips, the killing of roaches, guinea pigs and dogs did not prove anything for or against amalgams.

Dr. Spalding made the statement of scraping mercury from the mucous membrane of the mouth, so that globules could be seen. In a paper we reprint in this number, Dr. Spalding shows too much common sense to be supposed to exaggerate about the above mercury-globules; yet if it proves anything, it proves that even immense quantities of mercury may be tolerated in the system without the effects attributed by Dr. Talbot to a single amalgam plug!

Dr. Taft—without doubt a very honest skeptic—never used amalgam, and he, of course, hails with joy everything supporting his dislike. But dislikes are nothing scientific. He dreads the vapor of mercury. But let us follow a little this vapor from the plugs. As the vapor has formed at the temperature of the mouth, it can only become condensed—as globules—at temperatures *lower* than that of the mouth. But the lungs have a higher temperature, hence no condensation takes place there; but nowhere else in the body does the vapor find any place for condensing; nay, even granting for a moment, that the vapor like that of oxygen may become absorbed by the blood, the surface of the whole body will evaporate the mercury absorbed and, as Dr. Talbot himself admits, in proportion to the surface. Now supposing an amalgam-filling of only (!) one square inch area; the area of the body being about 2,000 square inches, there will mercury evaporate into the surrounding air 2,000 times faster than it is taken up; hence to talk about cumulative effects under such conditions would be sheer nonsense. Besides, we must never forget that while man breathes about 27,000 cub. ft. of air in three

months, the quantity of mercury evaporating in that time could not be weighed by Dr. Talbot himself. Yet granting that one-half milligram evaporated, this was diluted with 9,477 million times its weight of air; it was furthermore—if possible—secreted 2,000 times faster than inhaled, and yet those roaches died from the vapor of twice their weight of pure mercury, and lots of people die every year from—railroad collisions. "Thy faith hath made thee whole." If these are the kind of experiments upon which homœopathy rests—and the drift of the discussion shows that they were accepted by the homœopaths in the meeting as proving something—we need not wonder that *scientific* (??) homœopathy has become such a monstrous absurdity; and as there will always be plenty of people unable to distinguish between "post hoc" and "proptee hoc," between an "after it" and "because of it," homœopathy will always have followers who find causal connections between "carbo" and a ceasing tooth-ache! We should like very much to get some more such conclusive experiments from Dr. Talbot; but let there be at least an approximate or distant connection between the experiments and the theory which is to be proved by them.

SELECTIONS AND ABSTRACTS.

SUGGESTIONS RELATIVE TO THE CAUSE OF RAPID DENTAL DECAY.

BY DR. C. W. SPALDING, OF ST. LOUIS.

During the last year I have given considerable attention to the examination of the mixed fluid of the mouth which is commonly denominated saliva. This examination has been devoted chiefly to the chemical properties of this fluid, with a view of determining how far this property of saliva is responsible for that rapid decay of the teeth which practitioners of dentistry so often encounter.

In common, I believe, with many other practitioners, I have supposed that an acid condition of saliva prevails, or at least may usually be looked for in most cases of rapid decay of the teeth. Under this impression I entered upon a series of chemical tests with a view of endeavoring to discover the cause of this assumed chemical condition of saliva.

My observations have resulted in the formation of an opinion amounting almost to conviction, that the agency heretofore ascribed to the chemical condition of saliva in promoting decay of the teeth in healthy persons, has been largely over-estimated, if it has not been altogether erroneous.

My first experiments were made upon the saliva of a young girl (aged 12) whose teeth were decaying rapidly, so much so that fillings previously inserted, that is, before the case came into my hands, whether of gold or of other materials, had lasted but a short time, and in whose teeth new cavities were constantly forming, and this at so rapid a rate that cavities of considerable size would form in the space of a few months, notwithstanding pretty thorough cleanliness and good general care. I looked to find an acid reaction of the saliva in this case, and had been reflecting on a course of medical treatment, having in view the correction of this supposed condition of the saliva. What, then, was my surprise, on finding after repeated tests, that the saliva of this young person exhibited in every test either a neutral or a slightly alkaline chemical reaction! In no one of a large number of tests was there any, even the smallest acid reaction shown. I immediately sought other cases where a similar destructive process was going on, but the result in each was precisely the same as in the case just narrated. Indeed, in none was an acid condition present where the subject was in passably good health.

A professional friend also made similar tests in some very marked cases of rapid decay with the same results—no acid condition of saliva revealed.

I do not wish to be misunderstood. I am not combatting the idea that an acid condition of the saliva would promote decay of the teeth. I have no doubt it would do so, but I am endeavoring to show this condition of the saliva is not usual in states of ordinarily good health while the teeth do often rapidly decay, although the general health is not perceptibly, or at least not seriously, disturbed. The view I now present is, if the general health is good or fair, and the saliva normal, or nearly so, any rapid decay of the teeth must be attributed to some other cause than acid saliva. In certain localities favoring the lodgment and retention of food, decomposition of food substances probably takes place accompanied perhaps by the generation of acid. But many of the cavities of the class now under consideration, are located at points very unfavorable to retention, and it would not be fair to assume that decay occurring at these points was

occasioned by products resulting from either the partial digestion, the oxidation, or any other change in food substances.

Are there any other known methods by which acids may be generated, to whose action this rapid decay of the teeth may be fairly attributed? Let the chemists answer. If yes, the methods should be sought out and explained that the chemical theory, as it relates to this class of cases, may be fairly presented. If, however, the chemical theory is found, on thorough investigation, to be inadequate to the production of this class of cavities, or of any cavities under the conditions I have presented, some other cause must be invoked. Are these undetermined causes external or internal to the teeth, or both internal and external? Under the suggestion that internal forces may become important predisposing causes to decay of the teeth, our thoughts turn at once to faulty development, and to the period when calcification of the teeth is going on. The calcification of the deciduous teeth commences about the fourth or fifth month of fetal life, and that of the permanent teeth during the ninth month of fetal life, or the first month after birth. It will therefore be seen that if medicinal treatment is to be attempted, it should be commenced at an early period of fetal growth. The calcific process continues uninterruptedly until the completion of the third molars, which it is probably safe to say does not take place earlier than the fifteenth year. Yet I think we may with fairness conclude that if the deciduous teeth are perfectly developed, no medication will be required to insure a similar condition of the permanent set.

If defective development is to be regarded as a primary predisposing cause of the early and speedy decay of the teeth, our attention should, first of all, be directed to the most effective means of correcting this evil. Evidently there is but one mode by which preventive or corrective methods can be made effectual previous to birth. It is only through the blood of the mother that ante-natal treatment can be successfully applied. But whether defective development is due to a scanty supply of nutrient material, or to a lack of assimilative or developmental force in the individual, is first to be considered, that treatment may conform to diagnosis. If to insufficient supply, would not the defect be manifest in the general osseous system? The amount of mineral salts requisite for the calcification of the teeth—or I might limit the comparison to the enamel of the teeth—is small, compared with that which is necessary to construct the entire skeleton. I may here notice the fact that bone and dentine are but imperfectly calcified

at birth, and that deposition of lime salts goes on at a rather rapid rate for a considerable time after birth; and it should also be noted that the post-partum deposition of lime salts is probably slower and more difficult in enamel than it is in either bone or dentine. This latter implies the greater need for ante-natal methods of insuring the perfect formation of enamel. But to return. The relatively small amount of lime salts composing the hard elements of an entire denture would scarcely be missed if the deficiency was equally distributed over the whole osseus system. If defective enamel is owing to an insufficiency of supply, would not the defect be general and show itself elsewhere as well as in the enamel of the teeth? I am aware that the tardy closing of the fontanelles, and the late hardening of the bones of the infant, are indications of a lack of ossific material; but these cases are exceptional, and include but a small proportion of those in which rapid decay of the teeth is a marked and prominent symptom. If this condition does not proceed from a deficiency of nutritive material, it must necessarily arise from a want of assimilative force. I am inclined to accept the latter hypothesis, and to attribute the faulty formation to what I may call defective lime function, rather than to a lack of the substance itself. If this view is correct, we are at once brought into the field of preventive medicine, a field that has been but imperfectly tilled, especially that branch which relates to medical treatment of the unborn child.

Probably Jenner was the first to bring into notice an useful example of preventive medicine when he announced the discovery that cow-pox inoculation was a preventive of small-pox. This was also one of the first revelations of the prophylactic utility of the law of similars. Grawvogl has more recently applied this law to the correction of hereditary ante-natal deformities, by the use of prophylactics administered to the mother. He reports a case of what may be called hereditary *hydrocephalus acutus*, although neither of the parents exhibited any tendency towards this disease. Two children had been born in this family and both had been attacked in early life, both cases terminating fatally. The parents are described as being healthy, both having blonde hair, thin skin and blue eyes, one being spare and the other of full habit. The disease began to be developed in both children coincidently with the eruption of the lower incisor teeth.

Osseus nutrition is always deficient in *hydrocephalus*, resulting probably from defective assimilation. This imperfection would probably manifest itself in the formation of the teeth as well as in the cranial

bones, and, if so, the cause must have been in operation previous to their eruption. This latter event is usually accompanied by considerable disturbance of the nutritive processes, and this disturbance may well be supposed to occasion manifestation of any predisposing causes of disease that had heretofore lain dormant. Hence, the concurrence of *hydrocephalus* and dentition.

In the treatment of the above-named case sulphur and calcarea phos. were given, one dose of either on alternate days to the mother, commencing at the beginning of gestation and continuing to the birth of the child. Two additional children have been born of the same parents, both under this treatment of the mother, and both now respectively five and three years of age, are reported as being fine, healthy children, entirely free from any hydrocephalic symptoms. This case was not reported for the reason that it was either a solitary or an unusual one, but for the purpose of illustration only. Similar treatment has been pursued in other families where there had previously been a hydrocephalic child, and the same good results have uniformly followed. Hydrocephalic children have also been successfully treated by similar means, with the difference that sulphur was not indicated after the disease had made its appearance, and was, therefore, omitted.

Another interesting case of preventive medicine has been recently reported by J. C. Burnett, M. D., of London, England. In 1874 Dr. B. was consulted by a gentleman about his children, the youngest of whom had double hare-lip. The one next older had a defect in the upper lip, amounting almost to hare-lip, while the third or oldest child had no similar defect. The first born being perfect, the second having an insufficiency of the upper lip, and the third having double hare-lip, it was thought, taking all the circumstances into consideration, that the fourth child would be likely to have double hare-lip and possibly cleft-palate. It was determined to endeavor to prevent so unfortunate an occurrence, and an attempt at ante-natal treatment was made with that view. Calcarea sulph. was chosen in this case in preference to calcarea phos. by reason of the psoric diathesis of the mother. At full term the mother gave birth to a perfect child, and subsequently the same treatment was followed through a second pregnancy with a like result.

The Practitioner for December, 1878, contains a paper "On the Preventive Treatment of Cleft-palate, Hare-lip, etc.," by Thomas P. Tuckey, M. D., of County Cork, Ireland. He reports the following case :

Mrs. H., aged thirty-five, mother of six children. Every one of the children has had hare-lip, two having also had cleft-palate. The mother could not call to mind any case of hare-lip in her own or husband's family. Both parents were strong, healthy persons, neither having ever been seriously ill. Dr. Tuckey proposed ante-natal treatment.

A pregnancy occurred, when the doctor prescribed the following mixture:

℞. Calcis phos. . . . ℥ j. grs. 20.
Calcis Carb. . . . ℥ j.
Bicarb. magnes.
Chlorid sodii.
Sodæ Phosph. aa–|–ss. M.

The above to be added to an 8 oz. mixture of gelatine, gum arabic, syrup of ginger and cinnamon water; 1 dram, three times daily.

As clefts in the palate and lip are said to be due to arrest of development prior to the end of the third month, Mrs. H. was put upon this mixture at once. It was no doubt intended to represent the constituents of bone. The essential parts are the lime, magnesia and phosphorus.

"The woman took her medicine regularly until the fourth month; at her full time she was delivered of a girl without a trace of deformity about her lips or palate."

Dr. T. reports another case, Mrs. L., "mother of eight children, most of whom had cleft-palate and hare-lip; in four of them the hare-lip was double, and more shocking objects of deformity he had never seen. One boy was perfectly repulsive. The woman believed herself pregnant, and was at once put on the medicine. She went her full time, bore a girl without hare-lip, indeed, but who evidently had had one in utero; for the lip, though united, was united crookedly, and one side was puckered up, as if by a slight and narrow burn."

It may be objected that these cases prove nothing; that there is no positive evidence that the same children would not have been born without deformity if no medicine had been given. To this I answer, I am only citing history, leaving every one free to draw his own inferences. Besides, I am only making suggestions for the purpose of drawing attention to the subject with a view to further investigation, in which I trust the members of this Society will join.

Embryology teaches us that the face is formed of a central portion

produced from the frontal process, and of right and left lateral parts derived from the extremity of the first visceral arch. From this arch proceed the parts from which the superior and inferior maxillaries are subsequently developed. At the period in developmental growth when the superior maxillary unites with the frontal process, a cavity remains which constitutes the nasal cavity. The palate and intermaxillary bones bridge this space, and thus the nose is separated from the mouth. There are many varieties of congenital cleft of the palate, differing, however, only in degree, while all of them may be said to result from arrested development. Whenever the inter-maxillary fails to unite with the maxillary bone, a cleft is the result. The same causes which produce the cleft, produce the corresponding hiatus in the soft palate or lip.

In conclusion, I wish to say that it does not appear to me to be a legitimate inference that this arrest of development is due to a lack of nutritive material. The maxillaries and all other parts of the osseous structure complete themselves in the usual way. The arrest of development is limited to a specific and comparatively insignificant anatomical part. If the arrest was due to a lack of material, would it not be likely to include a larger area, and at least affect other parts that calcify coincidently with those now under consideration?

I feel, Mr. President, that an apology is due for the hasty and imperfect manner in which these notes have been prepared. My excuse is that the paper is not intended as a treatise, not even as an essay, but only as a brief presentation of some of my thoughts relative to this obscure, yet very important, subject.—*From the Transactions of the Illinois State Dental Society.*

DR. LOUIS ELSBERG has resigned his professorship in the Medical Department of the University of the city of New York, and has been elected professor of Laryngology and diseases of the throat, in Dartmouth Medical College.

A NEW SOCIETY has been organized in New York city, called the Materia Medica Society. It has but two officers, who are chosen by lot, and not by ballot. Every person desiring to become a member must write an acceptable thesis. Its members now number thirteen, including some of the most eminent medical gentlemen in New York city.

EDITORIAL.

We extend our thanks to the sender of the *Pacific Dental Directory*, compiled by W. O. Thrailkill, editor of the "*Dental Jairus*."

An error crept into our last number. We spoke of the *Dental Register* as becoming a monthly instead of a bi-monthly; the *Register* was already a monthly long ago; our remark was intended for the *Ohio State Journal.*

We do not believe that *one* reading of our selected article this month will satisfy the advanced, thinking dentist. We copy it from the Transactions of the Illinois State Society, and have not seen it in print elsewhere. It is eminently worthy of a wide circulation, and of just that kind and tone that the *Journal* best likes to assist in bringing before the profession. We believe the doctor has "struck a lead" that "will pay to work." There is golden ore of *truth* ahead in that direction.

An article of Dr. Viney, which appears in this number, will show our readers and would-be contributors, that we do not savagely assail every dissenting view; we give every one of our contributors full liberty, without, of course, restricting ourselves as to the extent to which we express our opinions about his views. Thus the views of Dr. Viney about "vitalized," "vital" "vitality" seem to us those of the old schools, before physiology had become what it is, yet we wish to give also to those of our readers who have been brought up in these hypotheses and speculations some congenial food.

An announcement of the Dental Department of the University of California has been sent to us. If the display of good-sounding names means anything, the University intends to rank among the very best in the country. The dean of the dental department is Dr. S. W. Dennis, M. D., D. D. S.; the faculty has special professors in Operative Dentistry, Dental Pathology and Therapeutics, Dental Art and Mechanism, Physiology, Chemistry, Anatomy, Surgery. They mean to do some good work; from 8 A. M. to 6 P. M. they keep their students busy with lectures and clinics.

Some of our readers inquired about the words we employed for the different forms of nitrogeneous substances ocurring in the body. We call—with Elsberg—*bioplasson* the net-like structured live protoplasma-tissue as occurring in live beings. Dr. Beale gave to a similar substance the term *bioplasm*, but his bioplasm is of a more vague nature than the modern bioplasson. *Protoplasm* is the substance of the bioplasson from chemical standpoint, paying no attention to its structure. It might be correct to say: protoplasm, if assuming structure, may be termed bioplasson, but vice versa, we could not speak properly of bioplasson having affinity for oxygen; in this affinity for oxygen not the structure, which is essential to bioplasson, is of a determining nature, but its chemical constitution as protoplasm.

In this number we publish a reply of Dr. Williams, of North Vassalboro, Me., to our criticism of his article. Our readers will see that we are liberal and tolerant in "andiatur et altera pars." We would not promise to print every time as long a reply as that of Dr. Williams; but being personally not at all interested, only "scientifically," we wish ample discussion of the doubtful points. Those criticised may take it as granted that *we read their articles as carefully as possible*, and that probably the most careful perusal an article experiences is in our study; perhaps sometimes we read them more carefully and critically than they were intended to be read by their authors. But please, gentlemen, in replying, *do talk to the point*, otherwise we will never agree; nay, we might even feel compelled to have to cut a reply!

RAMBLINGS AMONG THE MONTHLIES.

A copy of the *Transaction of the Illinois State Dental Society* for 1881 has been forwarded to us, and though it is not exactly a Monthly, we did ramble through it. We first express our thanks to the sender, Dr. E. Noyes. By the index of the transactions we see that out there Dr. Black of Jacksonville, is one of the most active workers in the line of society work; Drs. Brophy (Chicago) and Spalding (St. Louis) also appear prominently. The leading original articles are: Dead Pulps and Alveolar Abscess, by H. H. Townsend of Pontiac; Dental Hygiene, by Dr. W. P. Richards of Elgin; Fractures of the Inferior Maxilla, by Dr. Thos. L. Gilmer of Quincy, illustrated by Dr. C. V. Black of Jacksonville; Development of the Enamel, by Dr. M. S. Dean of Chicago; The Chemistry and Physiological Action of Mer-

cury as used in Amalgam Fillings, by E. S. Talbot, M. D., D. D. S., of Chicago; What must be the Preparation for the successful Practice of Dentistry in the Future? by Dr. C. A. Kitchen of Rockford; Operative Dentistry, by Geo. S. Miles of Jerseyville; Fillings, by Dr. J. M. Hurtt of Peoria; Suggestions relative to the Cause of Rapid Dental Decay, by Dr. C. W. Spalding of St. Louis;—the last paper we copy in this number. Many of the papers and discussions reported are well worth reading, but we cannot enter into their details. We have already criticised at least parts of the articles of Drs. Gilmer and M. S. Dean. The paper of Dr. Talbot receives due care in this number.

Missouri Dental Journal. As far as the reader may find interest in the first article on Dental Reform, containing four pages full of what might be said in one-half a page, it is worth reading. The article on the treatment of teeth with dead or dying pulps, by Dr. H. H. Townsend, merits its publication; the author has or tries to get clear views of what he is writing about. We might slightly disagree on the term "muscular exhaustion," when applied to capillaries where there are no muscles properly; yet we do not know of any better to state shortly the fact. Most praiseworthy must appear the doctor's thoroughness in trying to save teeth. He is on the right track, and any poor, "devitalized," dead tooth preserved, in the gums, is worth many on the best hard-rubber set. Another good point is his advocating constitutional treatment together with the local one.

The *Odontographic Journal* of January, 1882, contains an article by Dr. Palmer. We suppose every writer has his peculiar style; we do not doubt that we have a decidedly peculiar style, but we feel ourselves in congenial company when reading the essay of Dr. Palmer on Preservation of Teeth by Filling. His style is all periods; we do not get always a clear idea as to whether one sentence has to be considered as belonging to a syllogism or as independently introducing a new fact. This, it is true, renders analysis and clear understanding rather difficult, but it gives a kind of variegated salad of good thoughts, and every sentence can be taken for itself without paying attention to the preceding and following one. To enter upon all the abrupt, disconnected, having-nothing-to-do little phrases which are either hopelessly dogmatical or just as hopelessly wrong, would uselessly occupy the space. There is a vast amount of excellent practical knowledge stored up in the doctor; but, alas, it reads in print so tumbled through the door all in one lump that we doubt if any man can follow the line of reasoning which runs somewhat the direction of the Labyrinth on Crete. We

are not bold enough to pronounce ourselves without fair trial about the results of the proposed gold-tin-combination. The views of Dr. Palmer, as far as he does not write about general things, but precisely to the point, are quite good and stated in accordance with chemical facts. The fact that gold and tin packed together form a kind of alloy is very new, and, if sufficiently confirmed, of great importance.

A number of "syllabi of studies in chemistry and materia medica," as used by the Philadelphia dental college, is given. Some terms are antiquated. The difference between combustibles and supporters of combustion is old and abandoned. When hydrogen combines with oxygen the combustion is mutual and both are combustibles; a stream of oxygen burns in an atmosphere of hydrogen, and vice versa. Rather meager is the amount of organic chemistry required.

Rev. Myron Adams, of the Rochester Academy of Science, publishes a paper on Amateur Investigation. It is true, if quantity of hypotheses and theories counts, the amateur leads, but the really scientific investigator hates that half-supported "guessing," "believing," etc., in which amateurs generally delight, and much of the notion that scientific theories are as fickle as creeds is due to the fact that outsiders so often are utterly unable to distinguish between the bottomless phantom of an amateur's fancy and the well reflected enunciation of a number of facts as a natural law by a competent specialist. Scientific men rarely answer these fictions and, of course, the amateur generally supposes that he has extinguished the scientific men. Very often amateurs give themselves great trouble to show the weak points of certain physical hypotheses like the ether-theory, as if physicists did not know them just as well or better; only by giving something better the amateur will find favor in the eyes of scientists. The greater the stock of positive knowledge of a man, the more valuable a theory pronounced by him, no matter if he be amateur or business scientist.

The February number of the *Cosmos* opens with an article of Dr. Wilbur F. Litch on Antiseptics in Dentistry. There is very little to be found fault with in his clear, precise statements. We should object to the phrase: that the "process of self-multiplication of bacteriæ is catalytic." This word "catalytic" is antiquated and nothing but an empty word without conveying an idea or giving a hint to an explanation. The passage about hydriodic acid in the pulp chamber deserves correction. Dr. Litch says: "The hydriodic acid, itself a

gas, etc., is instantly taken up by the water abundantly present, etc. Being in solution, the hydriodic gas under the conditions ordinarily present in the pulp chamber, may cease to be regarded as a factor in pressure." How could such a slip happen to Dr. Litch? Dr. Litch loses sight of the fact that this solution of hydriodic acid immediately will decompose the lime-salts of the tooth surrounding it, forming calcium-iodide; it will free the carbonic and phosphoric acids, the latter will in its turn decompose some more carbonates of lime, and thus Dr. Litch will readily see that the volume of carbonic acid gas generated will be equal to that of sulphuretted hydrogen decomposed. Nothing is gained, and the hydriodic acid by this decomposition becomes as powerful a factor in pressure as the gases of putrefaction were before its formation. Further on Dr. Litch says: that the hydriodic acid may be re-decomposed by oxygen present and yield iodine ready for new combinations with hydrogen. This is utterly impossible. First, no free hydriodic acid can exist in a capsule of lime-salts, as the pulp-chamber is; second, in a liquid where there is free oxygen there is no free hydrogen for the iodine liberated from hydriodic acid to combine with, hence there will be no such reaction possible as he describes. Dr. Litch calls the carbolic acid an adulteration of commercial creasote. We think there is no "creasote" possible without it. Considered chemically, creasote is always a mixture of much carbolic acid with cresol, phlorol, guyacol and creasol. Under our chemical column we will give some of the facts about this substance.

In an elaborate paper on: A Cause of lessened Prognathism, Dr. David Hunt bases much of his views on caricatures in Harper's Weekly by Nast of the "wild Irishman." How far such caricatures are of value in a scientific paper we do not know. The paper contains many words. A sentence like: "the greater part of the ganglion—Gasseri—is composed of *connective tissue cells*," needs a large amount of proofs. Of course, Darwin is once more annihilated, in one point at least, according to the opinion of the author of the paper.

The article No. XVIII., upon Regulation of the Teeth by the Positive System, by Dr. J. N. Farrar, must be a delightful reading to every practical dentist. The same holds good of the next article on Porcelain Crowns in Natural Roots, by Harry Weston.

The meeting of the New York Odontological Society, October 18, 1881, is reported. Dr. Louis Elsberg gave an address on electrical illumination and cautery in the mouth. He makes use of the oppor-

tunity to give his view of electricity. There is many a special physicist who may assent to Dr. Elsberg's view of electricity as a motion, yet the facts do not yet warrant him to pronounce himself decidedly. But his special view that vibrations between 40,000 times and 65,000,000,000,000 times a second constitute electricity will probably thus far have but few followers. We doubt if the term "production of electricity" is any improvement on Ohm's "electro-motive force." How a "production of electricity" can be multiplied or divided we cannot comprehend, unless it is "quantity" clad in another term. But by not agreeing in some points with Dr. Elsberg we do not wish to cause the impression as if the paper or the experiments were by any means poor; experiments and paper must have been highly interesting and instructive! Dr. Atkinson is right in saying that we ought not to depend on the old text-books; but who does that? We all get the latest, and a book on chemistry or natural philosophy made only ten years ago is already old in many respects. He thinks we can discard "quantity" and "intensity" of electricity by adopting the view of electricity as a mode of motion. By no means! Light, the most recognized mode of motion, has "quantity" and "intensity," and, besides, "pitch." Pitch is the length of the waves, intensity their height, and "quantity" the number of simultaneous waves reaching our eye in a given moment; and the same terms will have to be used of electricity, if it be a motion or something else.

CORRESPONDENCE.

REPLY TO PROF. MAYR.

The February number of the New England Journal of Dentistry contains a brief review and criticism, by the scientific editor, of my paper on the "Beginning of Physical Life," which appeared in the January number of the Cosmos. I believe this criticism is partly the result of a hasty reading of my article, but perhaps largely the result of a difference in apprehension of foundation principles. Different modes of thinking sometimes lead to such widely varying styles of expression that writers may attempt to convey the same ideas in language so unlike that there may at first appear to be no harmony between the two. But it seems to me that even a hasty examination of the first passage which Prof. Mayr has quoted, *if read with the*

context, must convince any intelligent reader that it *is not* "easily proved erroneous," and, also, that the ideas conveyed are identical with the illustration which he uses, apparently for the purpose of refuting my quotation from Beale. Prof. Mayr uses my quotation from Beale as follows: "The passage quoted from Beale—'Every particle of the bioplasm of living matter came from a pre-existing particle,' etc., seems to us wrong in this form." If this quotation had been carefully compared with the context, especially with the enumerated characteristics of bioplasm, the error into which Prof. Mayr has fallen would have been avoided.

The first of these characteristics, as quoted from Beale, is as follows: "The power of *altering* and *appropriating* certain soluble matters and communicating to these, properties or powers of the same nature as those which the already existing living matter itself possesses."

The fourth characteristic reads: "The power of infinite increase." That portion of my paper immediately following the passage which Prof. Mayr first quotes, reads as follows: "All matter intervening between the masses of bioplasson is formed material, *and is the result of pabulum, which, having passed through the condition of bioplasm, loses the properties of vital, germinal matter, and assumes a definite structure.*" Now compare the above with the Prof.'s illustration of a growing tree. He says: "Experiments have proved, beyond doubt, that the ammonia, the carbonic acid, the water and the salts of the soil can be made to combine by previously present 'bioplasm' and to form entirely new 'bioplasm.'"

Most certainly this is true, and in perfect accordance with all that I have written. The ammonia, carbonic acid, water and salts are the pabulum or food material of a growing tree. The bioplasm possesses the power of *altering* and *appropriating* these matters and communicating to them its own characteristics. As the pabulum is converted into germinal matter, the outermost portions of the bioplasm lose the properties of living matter, are pushed farther and farther from the center, and become *formed material*, or structural matter.

It is *certainly* true that every particle of living matter came from a pre-existing particle, but it by no means follows that the material of which living matter is composed was not formerly in an elementary condition. Prof. Mayr then attempts to depreciate the importance of Beale's theory of living matter by citing certain chemical reactions which, he says, are analogous. ***But an analogy is not an identity.*** The word itself implies that a likeness may exist between things in

some circumstances or effects, while the things themselves are in other respects *totally different.* There is no known phenomena in chemical reactions which has any tendency to break the force of what Dr. Lionel Beale has written concerning living matter. The pages of this magazine might be filled in describing the differences which exist between any observed chemical changes and the phenomena exhibited by the simplest particle of living matter. All scientific investigation, instead of narrowing the gulf which separates living from non-living matter, is constantly widening it. And this must of necessity be so, for in the inmost nature of things they are separated by a *discreet* degree, and nowhere can you pass from one to the other by continuous degrees. The power of chemical change is molecular. The force which determines chemical action or reaction resides in each individual molecule, and the conditions necessary for the exhibition of these forces are, to some extent, under human control. But no chemist has ever "breathed the breath of life" into a single particle of matter. None ever will. There is no "narcotic philosophy" or mere sentiment in this. I deny and repel any statement which implies that I limit the scope of human progress and discovery. On the contrary, I attempted to indicate some of the truths which I believe will be of the greatest importance in all future scientific investigation. I stand always for the highest and broadest culture, and the utmost liberty of thought and speech. I do not wish to write anything except in a spirit of true kindness and courtesy, but I also believe that the time has come for those to speak who believe that life means something more than an exhibition of physico-chemical phenomena. Poultices and anodynes are good in their proper places, but there comes a time when we must use the caustic and the knife unflinchingly.

We have heard enough about *physical machines.* One is almost constrained to believe that the *thoughts* of men who talk about force being conditioned in the cell mechanism, just as it is in the machine, are in some way made to order by machinery. Let us throw this trash to the winds and stand face to face with the living truth. I reiterate the statement which I made in the January number of the Cosmos: *Any theory of the origin of any form of organic existence which fails to recognize the subjective condition of life must end in darkness and confusion.* I must be allowed to consider this position impregnable and irrefutable. I care not to know who is authority for any statement. I simply wish to know how much of truth there is in it. I will welcome

the discoveries which each day brings, but I must be my own interpreter of the facts. If Prof. Tyndall has taught us many things concerning heat, light, electricity, and sound, is that a reason why we should regard with approval his statement that he can discern in matter the "promise and potency of all terrestrial life?" Because Huxley and Haeckel have added volumes to our knowledge of natural history, shall we allow them to circumscribe our methods of investigation? These men who plead for liberal thought are too frequently the very ones who attempt to limit the scope of vision of any who desire to look beyond their field of labor. These thoughts were in my mind when I asked the question which Prof. Mayr has quoted: "But who has ever been able to trace and connect these changes in a germ?" I did not imply or intend to be understood as implying that these changes might not some day be rationally interpreted. But I am willing to place myself on record as saying that no "machine theory" can ever rationally interpret these things.

In the paper which was the subject of Prof. Mayr's criticism, I aimed to be suggestive rather than affirmative. I will now attempt to speak with no "uncertain sound," and to use language which cannot well be misunderstood. Life is not only the *cause* of form in organisms, but *is the form itself.* From the grey lichen which clings to the bleak rocks of the mountain side, up through every form of vegetable life, to the sacred ficus religiosa of two hundred centuries, beneath whose shade Gotama underwent his divine transfiguration; from the Bathybius Hackelii, 15,000 feet beneath the surface of the sea, up through every form of animal life to man, runs this law: *Life is the cause and form of organism.* The germ of an immaterial entity, call it by whatever name you please, is co-existent with every form of material organic life. Apply all of our present scientific knowledge to the growth of a blade of grass, and what does it explain? Only the outer, objective exhibition of phenomena. The discovery of every new fact only adds to the mystery from a materialistic point of view. I find no fault with the man who contents himself with studying effects. I admit the importance of knowing the exact chemical quantivalence of the albuminoid compounds, but I also claim for myself the unchallenged right to penetrate, if possible, beyond this plane of effects into the region of causes. The *Why* is of more importance to me than the *How.* I believe that the inner, immaterial relationships of life are of primary importance, and that if our scientific investigators kept this grand principle constantly in view we should soon have something

more to show as the result of our labors than a vast heap of lifeless, insignificant facts.

J. L. WILLIAMS.

North Vassalboro, Me., Feb. 20, 1882.

The S. S. White Dental Manufacturing Company send us the following printed circular:

DENTAL DEALERS' CONVENTION.

A convention of dealers and manufacturers of dental goods was held in the city of Pittsburgh, Pa., on the 8th and 9th of February, 1882, in pursuance of a call issued by a number of dealers for the purpose of securing harmony in the trade, and of dealing justly with customers by adopting a fair and equitable one-price system.

J. Littlefield, of the house of Codman & Shurtleff, Boston, was elected president, and Lee S. Smith, of Pittsburgh, secretary.

A permanent organization was resolved upon, and a committee was appointed to perfect the details thereof.

Resolutions were adopted looking to the regulation of prices and to business intercourse between the members of the association.

The utmost harmony and good feeling prevailed, and the convention adjourned to meet at the call of the Committee on Permanent Organization.

The following houses were represented:

Lee S. Smith; W. M. Herriott; Ransom & Randolph; Cogswell & Gee; Spencer & Crocker; George W. Fels; L. J. Frazee; Buffalo Dental Manufacturing Co.; H. J. Caulkins; J. R. Tantum & Co.; A. M. Leslie & Co.; The S. S. White Dental Manufacturiug Co.; H. D. Justi; Chicago Refining Co.; Gideon Sibley; C. B. Woodworth & Co.; J. L. Brewster, Jr.; Hood & Reynolds; J. B. Dunlevy; Lukens & Whittington; Codman & Shurtleff.

To prevent the loss of small screws in removing them to clean engine, hand-pieces and other delicate machinery, the steel screw-driver may be magnetized (either by rubbing upon *one* pole of a horse-shoe magnet, or by passing an electric current through an insulated wire wrapped about the tool), and when removing or returning the screw it will adhere to the driver, greatly facilitating the operation.

Dental Register.

OPERATING TABLE AND LABORATORY.

REPAIRING CELLULOID PLATES.

Repairs on celluloid require much more care than those on rubber. The beautiful cases made by the New Mode process with stippled gums are many times almost ruined by repairs conducted in a careless manner. The *pure tin* foil should be laid over the entire gums and well rubbed down with a towel or napkin so as to retain all the stippling as well as the case-hardened surface. Some plates may be almost covered in this way, but it must be done with *care*, if success is desired. Plates thus prepared before flasking will come out with these portions as perfect as before.

TIN FOIL FOR LINING CASTS.

Those who use the heavy tin foil for lining casts in the moulding of rubber or celluloid cases, have perhaps been much troubled by the foil not being easily removed, requiring much picking and scraping. This is because the foil is so largely adulterated with lead. If the foil is *pure tin*, and well burnished to the model, it can be torn from the case in an almost entire piece and will leave the rubber or celluloid in a bright and polished condition. It may be known from the adulterated article by its whiter appearance; also by its more fibrous condition in tearing. Ask for *pure tin foil*, and have no other.

CARE OF THE DENTAL ENGINE.

Since the dental engine was introduced to the profession there has been a constant call for a reasonably perfect hand piece. This has given rise to much study and experiment, and whatever result may be attained in the future, we have at present, at least, two which are worthy of praise. It must be remembered that any mechanism as fine as these should be well kept. Saliva and grit, which occasionally reach the bearings, will do more injury in a day than a month's ordinary use. Frequently separate and thoroughly cleanse the parts and use only a reasonable amount of oil. We call attention to this subject for the reason that we are sure it is deserved. We know the manufacturers will be grateful for this item, for they are often blamed for what is simply a result of our own negligence.

HOME MADE CORUNDUM POINTS.

I don't know that I can add any thing to the value of your paper, but will tell what disposition I make of my worn out engine burs. I used to consider them as dead stock, but of late have found them very useful. I take pieces of old wheel corundum, (not too coarse) and melt or soften them on a piece of sheet iron, then I put my bur in the hand piece, heat the point and revolve in the melted corundum until it softens as much as I want for the point, and while it is yet warm I revolve it on any smooth surface and true and shape them as I wish. I make some long and slim; some round; some cone shape, and some inverted cones. They can be made very quickly and with very little trouble. They are splendid for finishing fillings, and better than burs for opening cavities; when used under water or saliva, they cut almost as fast as the best bur. They leave the edges in better condition, do not heat the tooth and cause very little pain. I have used these points for some time almost to the exclusion of burs, except some of the smaller ones. I would almost as soon part with my engine as these home made points.—G. M. MERRITT, in *Items of Interest.*

Every dentist who has used stoned engine burs is aware of their superiority to the ordinary cavity burs. They cut faster, consequently with less friction, and they produce less pain in operating with them upon sensitive dentine. Those who comprehend the structure of dentine, readily understand why a clear sharp cut across its exposed sensitive surface is less painful than a grinding, tearing cut.

It is a comparatively easy matter for the dentist to stone his own burs, whether those previously stoned and worn or the ordinary cavity burs. It requires but a short time to bring each leaf of the bur to an edge with the use of a knife-blade-shaped Arkansas stone, examining the bur occasionally during the process under a pocket microscope or hand magnifier. It is essential to perfect work that the stone be kept at a keen edge, and this is easily done as follows: Take a strip of sheet lead three inches wide by fifteen or eighteen inches long and attach it *evenly* upon a straight and *perfectly level* piece of wood about two-and-a-half inches wide and a little longer than the lead. Allow the lead to extend over one end and the sides of the wood, bend the lead over and tack it to the wood over the sides and end—*not on the top.* Upon the top surface thus formed sprinkle some No. 1 emery, and without wetting or oiling the surface rub the stone lengthwise with the strip. Not more than three minutes' rubbing of the stone, after it has been used to sharpen a dozen burs, will be necessary to bring it to the required edge again.

CHEMICAL FACTS, HINTS AND QUERIES.

CARBOLIC ACID AND CREASOTE.

Though both substances are very similar in their reactions, there is a certain difference, owing to the fact that creasote is an impure commercial article of varying composition, while carbolic acid is a fixed chemical compound.

Carbolic acid is benzine or benzol (C_6H_6), in which one H is substituted by HO (hydroxyl), so that carbolic acid, according to the modern chemical views, is called Hydroxy-benzol $C_6H_5.OH$. Other names for it are: Phenol, phenyl-alcohol, and sometimes—though erroneously—even creasote; all these names mean the crystallized carbolic acid. Carbolic acid is made from coal-tar by a complicated treatment with alkalis and fractional distillation. Pure carbolic acid, or phenol, forms long colorless needles, melting at 43° C. (109° F.), and boiling at 184° C. (363° F.); it forms a combination with water —or a hydrate—containing over 90 per cent. of carbolic acid. Pure carbolic acid does not alter in the air. Besides its uses for surgical purposes, carbolic acid is very important for the fabrication of many dye-stuffs, like picric acid, etc.

Creasote is the crude article, prepared from the tar obtained by destructive distillation of beech-wood. It is a mixture of carbolic acid, cresol, creasol, phlorol and guyacol; the greater part of it is carbolic acid, though its amount varies exceedingly, depending greatly on the temperature at which the beech-wood was distilled. ***Cresol*** is the carbolic acid of the toluol, that is, of a benzol (C_6H_6) in which one H is substituted by CH_3, the radical of wood-alcohol; hence:

Benzol C_6H_6	Toluol $C_6H_5.CH_3$
Carbolic acid $C_6H_5.OH$	Cresol $C_6H_4.CH_3.OH$

The cresol, or methyl-carbolic acid, resembles very much carbolic acid in odor and reactions. It is somewhat less soluble in water; ***creasol*** is the characteristic substance in creasote, though it is there in very small quantities—sometimes not more than a few per cent.; it is a complicated compound, $C_6H_3.OH.CH_3.OCH_3$; has no very marked properties, and is much less "antiseptic" than carbolic acid or cresol; it has an aromatic odor, very different from carbolic acid. ***Phlorol***, having the formula $C_6H_3.OH.CH_3.CH_3$, is a substance resembling very much carbolic acid; the amount of it in creasote is small. Guyacol,

$C_6H_4.OH.OCH_3$, is an agreeably smelling liquid, if pure; the "antiseptic" powers of guyacol and creasol are not as marked as those of phlorol, cresol and phenol, hence the power of the creasote depends chiefly on these three.

The term "antiseptic" is slightly vague, since it is not settled what "septic" is; if we term an "antiseptic" a substance having the power of preventing putrefaction, we have to consider that there exists hardly any substance, which if present in sufficient quantity, will not prevent putrefaction; the term putrefaction needs exact defining, too. Common salt is an antiseptic; sugar is an antiseptic, if employed in sufficient quantity, hence, to separate substances into antiseptics and non-antiseptic is impossible, and only attempted by those who think order in nature cannot exist, if they do not make boxes of ideas labelled by a foggy name, into which they distribute all substances. Too often we are apt to think that names which are given for practical convenience's sake, are scientifically exact or tenable.

M.

Dr. E. S. Niles, of Boston, Mass., had the kindness to draw our attention to experiments of Magitot that the tooth substance is not decalcified by ammonium chloride. He is perfectly right, and we would be wrong—if we had asserted anything like ammonia-salts dissolving the tooth substance. Our article on albuminoids shows that we do not look for the dissolving power to one of the common acids or alkalis, but to an albuminoid which reduces the organized tooth-substance to its embryonal condition—a solution of lime-salts in albumen. Dr. Niles says he has found all dental cavities, where caries is in active progress, of a distinct acid reaction. A carious cavity is a whole laboratory; outside, the decayed tissue may be strongly acid, inside perhaps alkali, and close to the tooth substance necessarily neutral. Just as in one part of a chemical apparatus—say of making an ether—there may be an acid in the flask, a caustic potash tube connected with it, a chloride of calcium tube connected, etc., and all kinds of reactions obtainable in accordance to where we test; thus, one spot of the decaying mass may be acid, another alkali; but close to the teeth there can be nothing but neutral. No free acid is imaginable for a moment in contact with carbonate of lime. We, of course, speak of the exact boundary line between the decayed mass and the healthy tooth-substance. Even carbonic acid would immediately combine with carbonate of lime to form bicarbonate of lime. If, therefore, Dr. Niles observed acidity—and we do not doubt for a moment, knowing personally his chemical abilities, that he observed right—we think it due to the action of the oxygen of the air upon the protoplasm on the freshly cleaned cavity; if acidity is present at the boundary-line, it cannot have existed there for any length of time!

M.

PROSPECTUS.

First.—We believe that there is a promising field of usefulness in New England for a wide-awake, wisely-conducted Dental Journal. We believe, also, that the facilities, and a sufficient amount of concentrated energy and determination are at our disposal to warrant us in undertaking the responsibility of meeting this demand.

Second.—We recognize the fact that, to a greater extent than ever before, the dental profession "is imbued with the spirit of ***original investigation;***" that never before has there been so earnest a demand for ***absolute facts and scientific exactness,*** in place of careless statement, fanciful theorizing and undue reverence for venerable authorities. In view of which, we have secured the services of an eminent and broadly educated scientist, not only to preside over this department of the Journal, but to work with us in a systematic review and sifting of the accepted basal principles of dental science and a diligent and organized search for such new truths as the rapidly advancing and broadening fields of the sciences in general may have in store for our specialty. Results from this source will be promptly communicated through this Journal.

Third.—The "Associated Dentists," who comprise the general editorship, are all actively engaged in the practice of dentistry, and are entirely independent of all alliances and ambitions other than the best interests of the profession in its highest sense.

Fourth.—It is hoped that the dental profession will make free use of these columns as a ready means of intercommunication. Consider it, gentlemen, as your own, and take an active interest in it. We especially call the attention of Secretaries of Societies to this point, and hope they will act upon it.

Fifth.—While we are domiciled in New England, and assume our name as a convenient one to distinguish this from other Journals, we nevertheless aspire to the plain of making our influence felt for good, in common with so many other New England institutions, throughout the entire land.

Sixth—We earnestly solicit the aid of the profession in subscriptions, and original contributions, incidents of practice, etc., promising, on our part, to exert ourselves to the best of our joint ability to realize your ideal of a dental journal.

NEW ENGLAND JOURNAL CO.,

SPRINGFIELD, MASS.

NEW ENGLAND JOURNAL CO.,

SPRINGFIELD, MASS.

Inclosed, please find $2.00, for which send me the "**New England Journal of Dentistry and Allied Sciences**" for one year, commencing with ..... No., 1882.

Name, ...

Street No.

Post-Office,

County,

State, ...

Subscribe Now.—P. O. Money Orders, Stamps or Checks received for subscriptions.—Bank Bills sent at the risk of sender.